

♀. Much larger and broader than the male, the primaries above without any black spots, and all the wings below of a deeper rose-colour almost to the borders. Expanse of wings 53 millim.

New Britain and Duke-of-York Island.

We have a still larger female (58 millim. in expanse) in the Museum collection, presented by Messrs. Salvin and Godman: it was received from New Ireland; and hitherto I have regarded it as probably the female of the more narrow-winged, paler, and somewhat differently spotted *Aloa bifrons* of Walker. The receipt of the true male, however, puts this quite out of the question; indeed I am of opinion that *A. bifrons*, with its elongated narrow wings, is congeneric with Cramer's *Phalæna amasis*, and I would suggest its being placed with it under Hübner's generic name *Rhodogastria*; the first two species placed under the latter group by Hübner fall into other genera.

42. *Damalis tigrina*, sp. n.

♂. Bright ochreous; primaries deeper-coloured at the base; with the exception of a large patch at the end of the cell, the apical half of the costal border, and the base, all the interspaces enclose longitudinal broad blackish stripes: abdomen with dorsal and lateral series of black spots. Under surface ochreous, the wings with a decreasing border of internervular black stripes; primaries with black costal margin; collar, prothorax, and front of pectus orange-ochreous. Expanse of wings 56 millim.

New Britain.

Nearest to *D. nebulosa* from Borneo, Malacca, and the Andaman Islands.

[To be continued.]

XVI.—*Contributions towards a General History of the Marine Polyzoa.* By the Rev. THOMAS HINCKS, B.A., F.R.S.

[Continued from vol. ix. p. 127.]

[Plates VII. & VIII.]

X. FOREIGN CHEILOSTOMATA (Miscellaneous).

Family Eucratiidæ.

RHABDOZOOM, nov. gen.

Der. ῥάβδος, a rod, and ζῶον, an animal.

Gen. char.—*Zoarium* erect, phytoid, composed of numerous

celliferous shoots, held together by a ramified stem made up of bundles of radical fibres given off from the inferior portion of the shoots; celliferous shoots consisting of a cylindrical bi- or trifurcate stem, which gives origin to the radical fibres and also to erect chitinous rods, on the summit of which are borne two or three similar stems, more or less dichotomously divided. *Zoecia* pyriform, ranged in linear series round an imaginary axis, so as to form cylindrical stems; aperture moderately large, subterminal, oblique. *Avicularia* not capitata.

I am indebted for specimens of this singular and beautiful form to Mr. J. Bracebridge Wilson, of Geelong, an able investigator of the Victorian Polyzoa, and an enthusiastic and experienced dredger. He has kindly supplied me with a quantity of his dredgings, and requested me to undertake the pleasant office of reporting upon any thing new which they may yield. As a first instalment three species, which seem to be undescribed, are dealt with in this paper, of which the present is by far the most remarkable.

A question may arise *in limine*, as to the systematic position of *Rhabdozoum*; and possibly it may prove to be entitled to rank as the type of a distinct family; but, for the present, I prefer to place it among the Eucratiidæ, with which it has undoubted affinity. The zoecia bear a close resemblance, in many respects, to those of *Eucratea chelata*, Linnæus; and they are disposed (as in that species) in linear series, each cell rising from behind the top of the aperture of the one below it; on the other hand, the redundant spinous armature and the extraordinary development of the radical appendages are eminently Bicellularian. *Avicularia* are of the rarest occurrence amongst the Eucratiidæ. The cylindrical arrangement of the cells and the rod-like pedicels on which a large portion of the celliferous stems are elevated, are distinctive characters and have no parallel in either of the two families referred to.

The chitinous rods, which constitute the chief peculiarity of the present form, are probably a modification of the (so-called) radical fibres. Both these structures originate on the surface of the cells which compose the basal portion of the shoots; the fibres tend downwards and constitute first the compound stem or trunk of the colony, and ultimately the rootlets, by which the whole composite structure is held to its place; the rods ascend and support the principal celliferous segments. At its upper extremity the rod expands into a kind of cup, the rim of which (in the only known species) is set round with long spines; and from this rises a short celliferous stem, which soon bifurcates.

Rhabdozoum Wilsoni, n. sp. (Pl. VIII. fig. 4.)

Zoarium composed of a number of shoots, held together by a rather thick compound stem made up of the radical fibres emitted from the base of each shoot, and forming a much ramified, spreading, arborescent structure; each shoot composed of two parts—(i) a short bi- or trifurcate cylindrical stem, bearing cells, from which the radical fibres originate, and (ii) a number of erect, slender, chitinous rods rising from this stem, supporting on their summit other celliferous stems of similar structure, dichotomously branched, the branches widening upwards; rods transparent, terminating above in a cup-like expansion, the edge of which is closely set round with spines, distinctly annulated immediately below the cup. *Zoecia* subpyriform, disposed in longitudinal series, and so that the orifices range in oblique transverse lines across the stem, translucent, surface smooth and glossy; aperture oval, occupying about one third of the length of the cell, with a thin margin, somewhat contracted below, the lower extremity turned slightly inwards, inferior portion of the cell narrowing downwards; immediately below the aperture two or three extremely long curved spines, articulated to a short tubular base, replaced in many of the cells by a small *avicularium* on a mound-like elevation, with a pointed mandible directed forward. *Oecium* terminal, rounded, smooth. Height of the largest specimen about $1\frac{1}{2}$ inch.

Loc. Off Port Phillip Heads, Victoria (*Mr. J. Bracbridge Wilson*).

The appearance of this very curious species is quite unique. At first sight, a well-developed composite specimen is not unlike a mass of one of the larger Australian *Bicellariae*; but the resemblance is merely superficial. The tall and slender pedicels, crowned by the delicate feathery tufts, are unlike any thing which I have hitherto met with among the Polyzoa, unless they may be compared with the stem of such a form as *Kinetoskias* (*Naresia*) *cyathus*, Wyville Thomson, which Busk regards as representing a radical tube, or rather "a coalesced bundle of tubes" *.

The basal or primary portion of the shoots in *R. Wilsoni* is usually composed of a triplet of short stems, which converge below, and are borne on a kind of peduncle made up of numerous radical fibres compactly bound together, which ultimately unite with other peduncles, all of them, towards the base of the specimen, forming a thick trunk. The fibrous peduncle

* "On a peculiar Form of Polyzoa closely allied to *Bugula* (*Kinetoskias*, Kor. & Dan.)," *Micr. Journ.* vol. xxi. n. s.

on which each individual shoot is supported may certainly be regarded as the representative of such a structure as the stem of *Kinetoskias*. The rods originate from the side of a zoœcium, and rise to a height (including the terminal stems above) of about half an inch; they are much thicker than the ordinary radical fibres. There are sometimes one or two twists or imperfect annulations at the base, and (as I have mentioned) immediately below the cup they are distinctly and very prettily ringed. As many as seven (or perhaps more) may rise from one of the basal triplets. The portion of the celliferous stem immediately *above* the cup, from which the dichotomous branches originate, differs somewhat from the rest. The cells composing it are furnished with a much larger number of spines than is usual (as many as six), and they almost form a continuous whorl round the stem (Pl. VIII. fig. 4 b*). The cup at the summit of the rod must be regarded as made up of partially aborted cells placed closely side by side, the spines of which constitute a perfect ring.

The zoœcia which carry avicularia are destitute of spines, the avicularian swelling occupying the position in which they are usually developed. The spines are a very characteristic and conspicuous feature of the species. They are of very great length, tubular and transparent, rising in twos or threes immediately below the aperture from a tubular base (to which they are jointed); they continue almost straight or slightly curved for a short distance, and then bend abruptly upwards, overarching the zoœcia and completely enveloping and embowering the stems. The zoarium is composed of delicate, glossy, translucent material.

I have not had the opportunity of making an examination of the genus *Kinetoskias*; but in *Rhabdozoum* we seem to have a somewhat parallel form belonging to the Eucratean group.

Family Membraniporidæ.

Group a (*FLUSTRIDÆ*).

Zoarium corneous and flexible, foliaceous, erect (in the adult state). *Zoœcia* with raised margins; front wall membranaceous or membrano-calcareous.

FLUSTRA, Linnæus.

Flustra reticulum, n. sp. (Pl. VII. fig. 4.)

Zoarium branched dichotomously, of a dark colour when

* This is a rough *camera lucida* sketch; but it gives a fair idea of the general appearance of this region of the zoarium.

dried; segments short, stout, the extremities somewhat obliquely truncate. *Zoæcia* quincuncial, on one surface only, rounded above, widest in the middle, contracted below, subtruncate at the base; margins rather prominent, smooth, destitute of spines; *avicularia* scattered amongst the zoæcia and on the same plane with them; area smaller than that of the cell, not expanded in the middle, running off to a point below, the inferior portion closed in by membrane, the upper occupied by the mandible, which is elongate (more than half the length of the area), rounded at the apex, and of a dark-brown colour. *Oæcium* large (about half the length of the cell), prominent, rounded above, inclosed by the membranous front wall of the cell above it, the oral margin forming a shallow arch, and terminating on each side in a triangular callosity.

Height of specimen about $1\frac{1}{4}$ inch.

Loc. Off Port Phillip Heads, Victoria (*Mr. J. B. Wilson*).

The zoarium in this species has a characteristic aspect, due to the very short and broad and truncate terminal segments. The surface appears rather coarsely reticulate, owing to the elevation and distinctness of the cell-margins. The oæcium is a marked feature; though overspread by the membranous wall, it is less deeply immersed than is usual, and the oral arch, with its callosities, stands out prominently.

EUTHYRIS, nov. gen.

Der. εἶ, well *, and θυρίς (dim. of θύρα), a small door.

Gen. char.—*Zoarium* corneous, erect, and foliaceous. *Zoæcia* with raised margins; aperture closed in by a membranaceous (or membrano-calcareous) wall; orifice surrounded by a chitinous border; oral valve furnished with a distinct hinge.

In this form the simple semicircular opening in the front wall of the cell, with the membranous lid characteristic of the normal *Flustra* (and *Membranipora*), is replaced by a much more highly organized orifice, which is bounded and, as it were, isolated by a distinct border, and furnished with a solid operculum working upon a hinge. We must, I think, recognize here the characters of a generic group, in which *Carbasea episcopalis*, Busk, and *C. bombycina*, Ellis and Sotlander, will rank, as well as the species which I am about to describe.

MacGillivray has recently constituted a genus under the name *Thairopora* for a parallel group amongst the *Membraniporæ* †.

* To suggest the idea of higher structure.

† "Descriptions of new or little-known Polyzoa," Trans. Roy. Soc.

Euthyris obtecta, n. sp. (Pl. VII. fig. 3.)

Zoarium much branched dichotomously; habit rather straggling, the segments tall, narrow, not expanded upwards, somewhat rounded at the extremities, with a smooth border along the edge. *Zoecia* on one surface only, quincuncial, subrectangular, margins not conspicuous; front wall smooth and shining, depressed below, rising towards the orifice, overspread by a membranous covering, which forms a flat uniform roofing over the zoarium; orifice of the ordinary cells suborbicular, with the lower margin flattened, surrounded by a chitinous rim and closed by a solid operculum; distributed amongst the ordinary zoecia are occasional cells which are broader and have a larger orifice, elongated transversely, narrow between the upper and lower margins, and slightly curved inwards below. *Avicularia* none. *Ooecium* (?).

Height of specimen about $3\frac{1}{4}$ inches.

Loc. North Australia (*Miss Jelly*).

Two points are worthy of notice in this species—the continuous membrane which overspreads the surface of the zoarium, concealing the true cell-wall, and the larger zoecia, with modified orifice, which occur in some number amongst the ordinary cells. The latter may be subservient in some way to the function of reproduction, though we have no direct evidence on the point; similarly modified cells have been noticed in other cases. The epitheca also occurs in many species belonging to very different families.

Family Myrizoidæ (part.), Smitt.

SCHIZOPORELLA, Hincks.

Schizoporella conservata, Waters. (Pl. VII. fig. 2.)

This species, which has been described by Waters from Tertiary beds in South-west Victoria, occurs in Mr. Wilson's dredgings from Port Phillip Heads. As the recent specimen differs a good deal in superficial character from the fossil form, I have given a figure of a few of the cells. Mr. Waters describes the surface of the zoecium as smooth; in Mr. Wilson's specimen it is strongly areolated round the margin and reticulate in the centre. The avicularia, which are numerous, are of the lanceolate type; the mandible is long and slender

Victoria, December 1881. I have already ('Annals' for July 1880) directed attention to the structural peculiarities of this group as probably supplying the basis of a new genus, and am glad to find that this view is supported by Mr. MacGillivray's authority.

and bent at the extremity; they are almost universally raised. A shallow arched groove crosses the operculum a short distance above the sinus, and is a rather conspicuous character.

The only specimen which I have examined may probably have been Hemescharine in habit, as the dorsal surface of the crust is overgrown with other Polyzoa.

Loc. Mount Gambier (*Waters*); off Port Phillip Heads (*Mr. J. B. Wilson*).

Schizoporella latisinuata, n. sp. (Pl. VII. fig. 5.)

Zoæcia quincuncial, hexagonal, bordered by conspicuous raised lines, usually terminating above on each side of the orifice in a nodulous projection; front surface dense, flattish (sutures very shallow), thickly punctured, overspread with a shining membranous epitheca; orifice arched above, a very wide sinus occupying about two thirds of the lower margin, straight below, the opening not at all contracted; peristome elevated and somewhat thickened round the top and sides, broad and flattened out below. *Avicularia* none. *Oœcium* (?). *Zoarium* forming a glossy patch of a brownish colour.

Loc. Off Port Phillip Heads (*Mr. J. B. Wilson*).

The form of the sinus in this species is remarkable; it is neither rounded below nor contracted at the opening. Its lower boundary-line is straight; and it is of about the same width throughout, occupying a large proportion of the inferior margin of the orifice.

Family *Escharidæ* (part.), Smitt.

LEPRALIA, Johnston (part.).

Lepralia striatula, n. sp. (Pl. VIII. fig. 1.)

Zoæcia ovate, quincuncial, rising considerably towards the centre; surface smooth, areolated round the margin, and traversed by radiating grooves, which pass from the areolæ upwards; orifice horseshoe-shaped, arched above, straight below, contracted by two opposite denticles a short distance above the lower margin; about as broad as high; peristome raised, carrying four spines above; on each side of the orifice (or on one side only) near the top a small *avicularium*, raised, with an elongate subspatulate mandible directed downwards; immediately under the inferior margin a swelling, which is carried up into a blunt point, and bears on its inner aspect a rounded *avicularium*. *Oœcium* rounded above, broad (sub-

crenate), compressed in front, where it is thickly covered with small punctures; the rest of the surface smooth, usually an umbo on the summit.

Loc. Zanzibar (*Miss Jelly*).

MUCRONELLA, Hincks.

Mucronella diaphana, MacGillivray, form *armata*.

(Pl. VIII. fig. 3.)

A form of this species occurs in New Zealand which differs in some respects from that described by MacGillivray, and most notably in being furnished with avicularia. It may be characterized as follows:—

Zoecia quincuncial, rather broadly ovate, distinct, the front wall somewhat flat and depressed below, rising towards the oral region; surface smooth, of a delicate greyish colour; orifice arched above, straight below, three denticles within the lower margin, the central one the largest, and at the top four long jointed spines, composed of calcareous segments, with chitinous joints between, articulated to a tubular base; in the centre of the lower margin a rather broad blunt mucro; at each side a little below the orifice (or sometimes on one side only) a raised avicularium, with pointed mandible directed outwards. *Oeciium* rounded, smooth, umbonate.

Loc. Queenscliff and Warrnambool (*Mr. Watts*): form *armata*, New Zealand (*Miss Jelly*).

Frequently there rises immediately above the orifice a kind of calcareous screen, pointed above and slightly hollowed out in front, which is not noticed by MacGillivray. The spines, which are all jointed and articulated to a tubular base, are usually four (occasionally five) in number on the New-Zealand specimens; the full complement is only met with on the margin of the colony; on the inner cells seldom more than a single spine survives.

Mucronella vultur, n. sp. (Pl. VIII. fig. 2.)

Zoecia very large, quincuncial, sometimes much elongated, usually ovate, convex, separated by deep sutures; front wall highly calcified, vitreous, surface silvery, uniformly covered with small circular foramina; orifice ample, suborbicular; peristome slightly raised, bearing on its upper margin six spines, articulated to a tubular base; within the lower margin in the centre a hammer-shaped tooth and two small lateral denticles; immediately behind the central tooth a massive mucro, bearing on one side a large *avicularium*; mandible running out to a very finely-pointed extremity, which is bent abruptly inwards, directed upwards. *Oeciium* (?).

Loc. Australia (*Miss Jelly*).

Mucronella præstans, n. sp. (Pl. VII. fig. 1.)

Zoecia ovate, quincuncial, often much expanded below, front wall rather depressed, strongly areolated round the margin, the central portion smooth or traversed by the prolonged radiating furrows of the areolæ; surface very bright and shining; orifice suborbicular; peristome carried up in front into a neck-like prolongation of considerable length, which often rises into a point in the centre (occasionally bimucronate), the lip somewhat everted and frequently much thickened, at the sides sloping off towards the upper margin, which is not elevated and bears four spines; on one side of the cell, attached to the neck-like elevation of the peristome, and directed outwards, or sometimes placed lower on the cell and sloping obliquely downwards, a large spatulate *avicularium*, raised on a kind of bracket, the walls of which are perforated. *Oœcium* rounded, rising rather steeply towards the centre, somewhat prolonged and contracted towards the orifice, strongly areolated round the base; central portion smooth and shining, more or less traversed by the areolæ, mucronate.

Loc. New Zealand, recent, and from later Tertiary beds (*Miss Jelly*).

This is without question one of the most attractive of its tribe, its remarkable beauty being due to the exquisite border formed by the areolation round the cells and the brilliancy of the vitreous surface. The oral operculum seems to be composed of a thin almost membranous material. The raised peristome projects very considerably, and is commonly carried out to an acute point; frequently, however, it is broader in front; and the margin is often much thickened. There is some variability in the position of the *avicularium*; but it is usually placed against the neck of the cell or at the base of it.

Mucronella rotundata, n. sp. (Pl. VIII. fig. 5.)

Zoecia quincuncially arranged, with a more or less rounded outline, short, tumid, suberect, separated by deep sutures; surface smooth or slightly pitted over; orifice of (proportionally) large size, arched above, straight below, a central bifid tooth and two minute lateral denticles placed very close to it within the lower margin; peristome elevated round the sides and in front, where it is carried up into a central mucro of moderate size; on the upper margin four slender spines. *Avicularia* none. *Oœcium* (?).

Loc. Singapore or Philippines (*Miss Jelly*).

This has much the appearance of a distinct form, though in

some respects very nearly allied to *M. ventricosa*, Hassall. As only a small colony of young cells has been examined, I cannot speak with confidence as to some of the superficial characters; but the short subrotund and tumid cells, not contracted above as in *M. ventricosa*, the large orifice, not raised and suberect and closed in by the rather massive peristome and spines as in the latter, the three small denticles set closely together, the rather slender mucro, and the complete absence of striation and marginal punctures are all distinctive points. The cells are much smaller than those of *M. ventricosa* and of delicate texture; but this may be due to the immature condition of the colony.

In the absence of more fully developed specimens, I merely name it provisionally. It may rank as *M. ventricosa*, form *rotundata*, if further evidence should show that it is referable to this species.

Family Membraniporidae.

MEMBRANIPORA, De Blainville.

Membranipora pilosa, Linnæus, form *foliacea*.

I have received through Miss Jelly, from New Zealand, a specimen of an interesting form of this common and cosmopolitan species. It grows as an erect foliaceous frond, with the cells disposed on both surfaces and closely united back to back. Pallas mentions such a form in his 'Elenchus' as occurring in the North Sea* ; but amidst all the varieties of this protean species, from various parts of the world, which I have examined, it has never occurred to me before. We hardly require any fresh evidence to show that such varieties of habit are of very small systematic significance.

EXPLANATION OF THE PLATES.

PLATE VII.

- Fig. 1. Mucronella præstans*, n. sp. 1 a. Zoecium with avicularium; 1 b. Zoecium, showing the membranous (?) operculum as it appears when thrown back.
- Fig. 2. Mucronella conservata*, Waters, from a recent Australian specimen.
- Fig. 3. Euthyris obtecta*, n. gen. & sp. Group of zoecia, showing one of the large cells with modified orifice. 3 a. The same, natural size.
- Fig. 4. Flustra reticulum*, n. sp. 4 a. Zoecium with avicularium. 4 b. Natural size.
- Fig. 5. Schizoporella latissimata*, n. sp.

* "In frondes lubenter assurgit, utrinque cellulosas, crassiusculas, spongiosas; primo simplices . . . deinde ramosas, imo pinnato-multifidas."—*Elenchus*, p. 50.

PLATE VIII.

Fig. 1. *Lepralia striatula*, n. sp. 1 a. Oœcium.

Fig. 2. *Mucronella vultur*, n. sp.

Fig. 3. *Mucronella diaphana*, MacGillivray, form *armata*. 3 a. Oœcium.

Fig. 4. *Rhabdozoum Wilsoni*, n. gen. & sp. A shoot, of the natural size.
4 a. The same. Portion of a celliferous stem, magnified, showing the arrangement of the zoœcia, avicularia, and spines. 4 b. Summit of one of the chitinous rods, showing the annulation, the cup-like expansion, and the basal portion of the upper celliferous stems. This figure is less highly magnified than the rest.
4 c. Zoœcia, with oœcia.

Fig. 5. *Mucronella rotundata*, n. sp.

BIBLIOGRAPHICAL NOTICES.

The Student's List of British Coleoptera, with Synoptic Tables of the Families and Genera. Compiled by FRANCIS P. PASCOE. Small 8vo. London: Taylor and Francis, 1882.

IN this little volume Mr. Pascoe has gone back to his old love, and, after instructing us all in general zoology, contents himself with the more modest task of cataloguing the British Beetles. But, just as his little treatise on 'Zoological Classification' was one of the most useful manuals that we possess, so the 'Student's List of British Coleoptera' offers its readers a good deal more than is promised in its title. As regards the list itself, indeed, our author makes but little claim to originality. "Lists," he says, "are necessarily compilations; and in this one I have almost entirely depended on the authority of previous compilers;" but there is a certain amount of criticism that must be exercised even in the preparation of a catalogue of the names of British Beetles, hackneyed as the task is, and we know enough of Mr. Pascoe's work to feel sure that this part of his labour has been conscientiously performed.

As to the principles on which he has acted in connexion with vexed questions of priority, Mr. Pascoe has some remarks in his preface which merit attention. He complains, and with much justice, of the confusion introduced by the disturbance of old-established names of species and genera to make room for others of longer standing, the precise significance of which must often be uncertain from the imperfect manner in which species were generally characterized in the early days of descriptive entomology. To a very considerable extent we are prepared to go with him, and to join in any protest that he may make against superseding well-known names upon light grounds, even in cases where it can be demonstrated that the name to be revived undoubtedly applies to the same species that has for years borne another name of later date. But we are not prepared to go the whole length that he seems inclined to do, and to set up a sort of statute of limitations in matters of nomen-